Preclinical development of human hepatocyte progenitor cells for cell therapy

Grant Award Details

Preclinical development of human hepatocyte progenitor cells for cell therapy

Grant Type: Quest - Discovery Stage Research Projects

Grant Number: DISC2-09565

Project Objective: Determine if human hepatocyte progenitor cells, which exist in the normal adult liver, can be maintained and expanded in vitro while maintaining in vivo regenerative capacity.; expected outcome is a liver-derived, ex vivo expandable human hepatocyte progenitor cell population (HPCs) for treating liver damage/disease

Investigator:

Name:	Roel Nusse
Institution:	Stanford University
Type:	PI

Disease Focus: Liver Disease

Human Stem Cell Use: Adult Stem Cell

Award Value: $1,651,643

Status: Active

Grant Application Details

Application Title: Preclinical development of human hepatocyte progenitor cells for cell therapy

Public Abstract:

Research Objective

Determine if human hepatocyte progenitor cells, which exist in the normal adult liver, can be maintained and expanded in vitro while maintaining in vivo regenerative capacity.

Impact

Cell transplantation therapy can be an effective alternative treatment for severe liver diseases to liver transplantation, which is severely limited by the lack of available donor organs.

Major Proposed Activities

- Characterize human pericentral hepatocytes and their niche in normal adult human liver
- Determine if human pericentral hepatocytes function as progenitor cells in a humanized mouse liver model
- Compare the regenerative capacity of human HPCs with mature hepatocytes
- Determine the optimum in vitro conditions for maintaining and expanding human HPCs
- Examine whether endothelial cells promote in vitro expansion of human HPCs
- Assess the liver repopulating capability of long-term culture expanded HPCs

Statement of Benefit to California:

Cellular therapy for severe liver disease in the form of hepatocyte transplantation is effective alternative to whole organ transplantation. However, its usage is limited by the severe shortage of healthy primary human hepatocytes. The potential to generate patient-specific sources of hepatocytes from HPCs for cellular therapy would address an immense unmet clinical need.
